

Work Order ID 72716

Tuesday, August 09, 2011 3:13:28 PM

Page 1

Item ID: D212-664-101

Accept

Revision ID:

Item Name: Crosstube Fwd

Setup Start

Stop

Start Date: 8/9/2011 Start Qty: 1.00

Required Date: 8/19/2011 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: *CMF* Date: *11-08-09*

Tooling:

Date:

QC:




Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D212-664-141	Rev D (DEO)								
100		0.00							
	DOCUMENT CONTROL								
DC	Memo	0.00							
Document Control	Photocopy bluefile and create labels as per PPP D212-664-101		CHG005						
110		0.00							
	Pick Kit								
Packaging	Packaging								
Packaging	Memo	0.00							
120		0.00							
	BENDING MACHINE - CROSSTUBES								
CNC Bend 2	Memo	0.00							
CNC Alpha 160 Bender	Bend tube as per Dwg D212-664-141 using CNC bender program 212-fw and Folio D212-664-101								

8 wlos/24 *11-8-24*

DP *11-8-10*

DP *11-8-10*

D212 664 101 B 72716

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries.

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Customer:

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start _____ Stop _____

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130



QC

Quality Control

QC15- Crosstube Dimensional Check

0.00

Memo

0.00

8 w/oz 10

(4)

140



Crosstubes

Crosstubes

Crosstubes

Memo

0.00

0.00

1-Drill pilot holes in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549, using drill table DT8577, set-up towers in hole #7 as per QSI 10

2-Ream hole to finish size in tube as per Dwg D212-664-141 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-141

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-141

SAD 11-08-10

JW 11-08-11

SAD 11-08-15 (1)

(1)

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Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

150



HandFXtube

Crosstubes Chemical Conversion

0.00

Memo

0.00

Hand Finishing Crosstubes

Chemical Conversion Coat within 24 hours of bending and drilling

SAD 11-08-16

①

160



QC

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

Quality Control

Sulos/16

②

170



Outsource2

Outsource process - NDT per QSI038 4.1

0.00

Memo

0.00

Outsource process - NDT

Liquid Penetrant Inspection as per QSI 038
Issue P/O: 14697
LPI as per ASTM 1417 Level 2
Attach copy of NDT results to work order

C& 11/08/17 ①

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Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180



Packaging

Receive & Inspect for Damage & Mat'l Certs
Packaging

0.00

Memo

0.00

Packaging

Ensure copy of NDT results attached to work order.

CL 11/08/17 ①

190



QC

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

Quality Control

Inspect for damage & ensure results are as per Dwg D212-664-141

ST 11-08-17

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200

Spray Painting per QSI005 4.2

0.00



SprayPaint

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube as per DEO D212-667-141 with White Imron as per QSI 005 4.2

PRIME:

Start Time: _____

Finish Time: _____

PAINT:

Start Time: _____

Finish Time: _____

2T 11-08-21

210

QC14- Inspect Spray Paint

0.00



QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

11-08-22 17

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

220

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1-Abrade mating surfaces of support and crosstube with 400 grit sandpaper,
clean the area with 4105S wash 'n' wipe

2-Install supports with Proseal 890 per DSI9563 and QSI 015

A/R Proseal 890 Batch: 178234

3- Torque bolts as per dwg

ml 11 08 23 (1)

230

0.00



QC

QC6- Inspect dimensions to drawing

Memo

0.00

Quality Control

8/10/24

(4)

240

0.00



Packaging

Pick Kit

Memo

0.00

Packaging

11/8/24

W/O:		WORK ORDER CHANGES					
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Required Date: 8/19/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

250



QC

Quality Control

QC4- 100% Inspect kits for completeness

0.00

0.00

S vlog/24

⑩

Memo

260



Packaging

Packaging

Packaging

0.00

0.00

Reu A

11/8/24

Memo

Identify and pack for shipping as per PPP D212-664-101

270



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

0.00

Memo

11/8/24

11-0824 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

Picklist Print

Tuesday, August 09, 2011 3:13:22 PM

Page 1

Work Order ID: 72716

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd



Start Date: 8/9/2011

Required Date: 8/19/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:E 04.02.16 Reformat KJ/DS
 IPP Rev:F 06-03-29 Remove Coments on Pick List JLM
 IPP Rev:G 07-04-30 As per Rev C JLM IPP Rev:H
 11.04.26 inspection strip ecn 11-549 EC verified by:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D212-664-101TRN

Manufactured

No

110

Each

2.0000

1

1



Crosstube Turning Detail



SAD 11-08-09

Location

Loc Qty

Loc Code

FG046

2

71645

①

72038

1

72040

1

D3595-063-450

Manufactured

No

230

Each

78.5600

4

4.210526



RUBBER CUSHION



NL 11-08-23

Location

Loc Qty

Loc Code

LG

78.56

67353

3

68893

6

70113

0.56

71354

69

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Tuesday, August 09, 2011 3:13:23 PM

Page 2

Work Order ID: 72716

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd

Start Date: 8/9/2011

Required Date: 8/19/2011

Start Qty: 1.00

Required Qty: 1.00

MS21920-25

Purchased

No

220

Each

110.0000

4

4



Clamp(per MIL-DTL-8783C)



11.08.23

Location

Loc Qty

Loc Code

LG

100

113281

0

113282

0

118142

50

118183

50

LG050

10

116264

2

117998

8

D2893-1

Manufactured

No

220

Each

0.0000

2

2



2.75 Support

B#72586



11.08.23

D3428-1

Manufactured

No

240

Each

25.0000

1



Placard



11/8/24

Location

Loc Qty

Loc Code

ST053

25

68920

3

71168

10

72048

12

AN6-35A

Purchased

No

240

Each

85.0000

4



BOLT



11/8/24

Location

Loc Qty

Loc Code

ST343

85

117441

10

117872

25

118422

50

Y

Tuesday, August 09, 2011 3:13:23 PM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Picklist Print

Tuesday, August 09, 2011 3:13:23 PM

Page 3

Work Order ID: 72716

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd

Start Date: 8/9/2011

Required Date: 8/19/2011

Start Qty: 1.00

Required Qty: 1.00

AN6-36A

Purchased

No

240

Each

87.0000

4



Bolt

Location

Loc Qty

Loc Code

ST343

87

117441

17

118012

20

118422

50

MS21042L6

Purchased

No

240

Each

342.0000

6



Nut

Location

Loc Qty

Loc Code

ST300

342

117677

200

118078

42

118384

100

AN960JD616

NAS1149D0663J

Purchased

No

240

Each

0.0000

18



Washer

Tuesday, August 09, 2011 3:13:23 PM

Shop Packet Print

Page 3

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

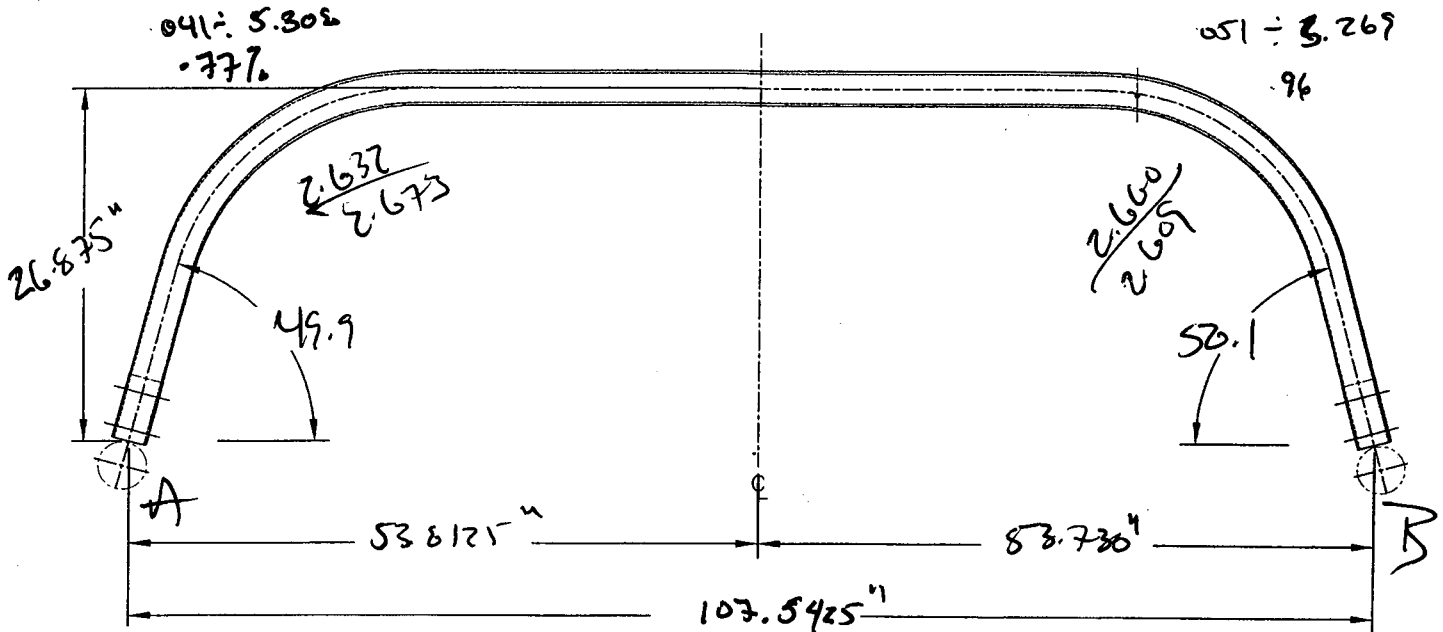
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DART AEROSPACE LTD		Work Order:	72716
Description: Crosstube High Fwd (205/212/412)		Part Number:	D212-664-101
Inspection Dwg: D212-664-141 Rev: D		Page 1 of 1	

Required Dimension	Min	Max
Height	26.79	27.05
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.7



Comments	
Side A 0.7%	crushing @ 8 Passes.
Side B 0.9%	crushing @ 7 Passes.

QC15 Inspection	S nlog/10
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.31	Dimensions updated per Dwg Rev C	KJ/JM	
C	10.04.01	Dwg Rev updated	KJ	

Item	Qty -141	Qty -141B	Part Number	Description
1	X		D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X	D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3	1	1	D6005-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	4	4	MS21920-25	CLAMP (OR MS21920-26)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 126.514±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF
USING VIBRATING STYLUS
- WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664)
D212-664-141B = 33.6 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

D	REFORMAT/REVISE GENERAL NOTES/PART LIST: REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C8-3 & B6-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	PH	DRAWING NO.	REV. D
MFG. APPR.	PH	D212-664-141	SHEET 1 OF 4
APPROVED	PH	TITLE	SCALE
DE APPR.	PH	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

REMOVED FROM UNDER REVIEW 922
UNDER REVIEW ECH 11-614
11-15
FOR PRO-SEALING SUPPORT 11-07-26

DEO ATTACHED

RELEASED
2009-10-29

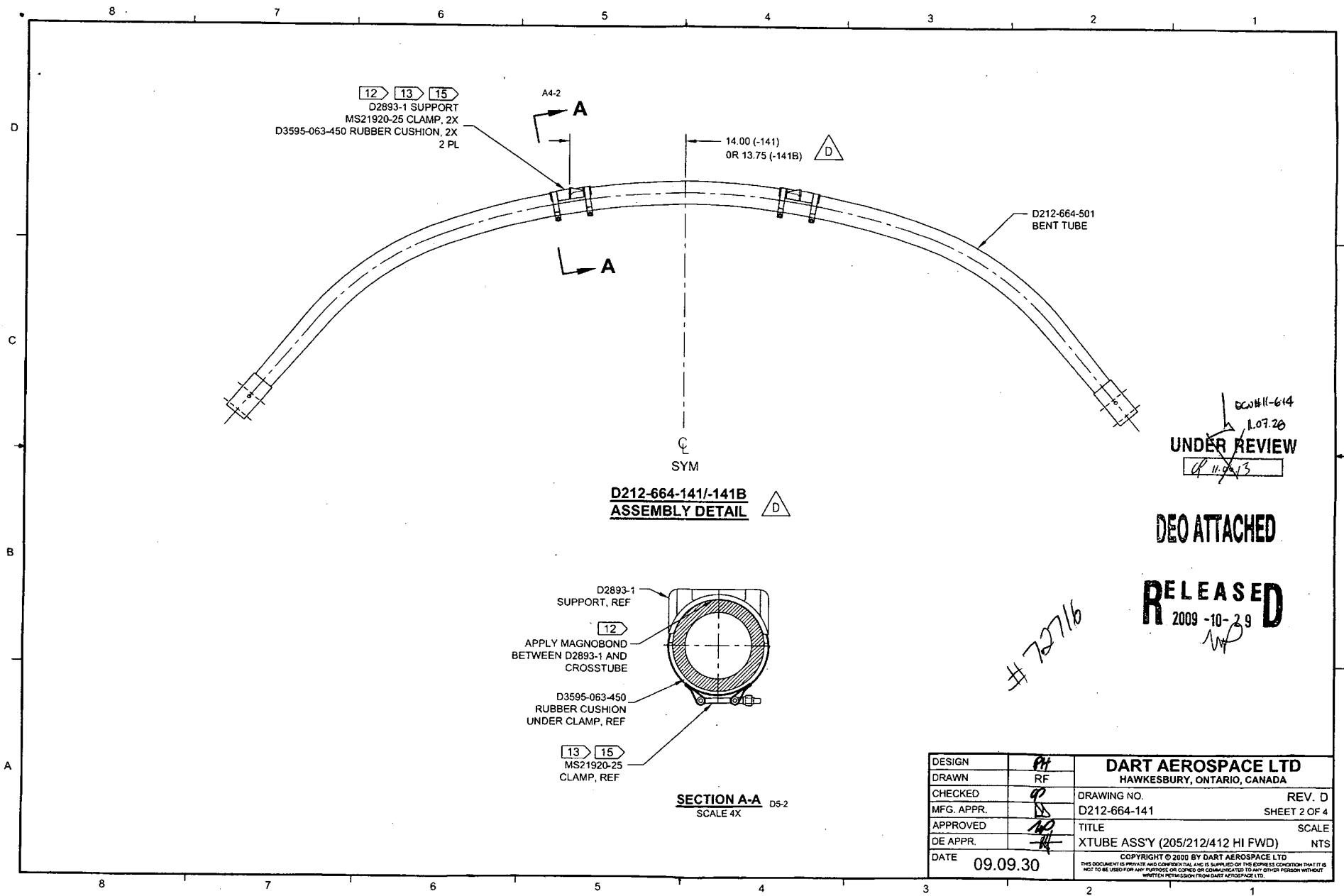
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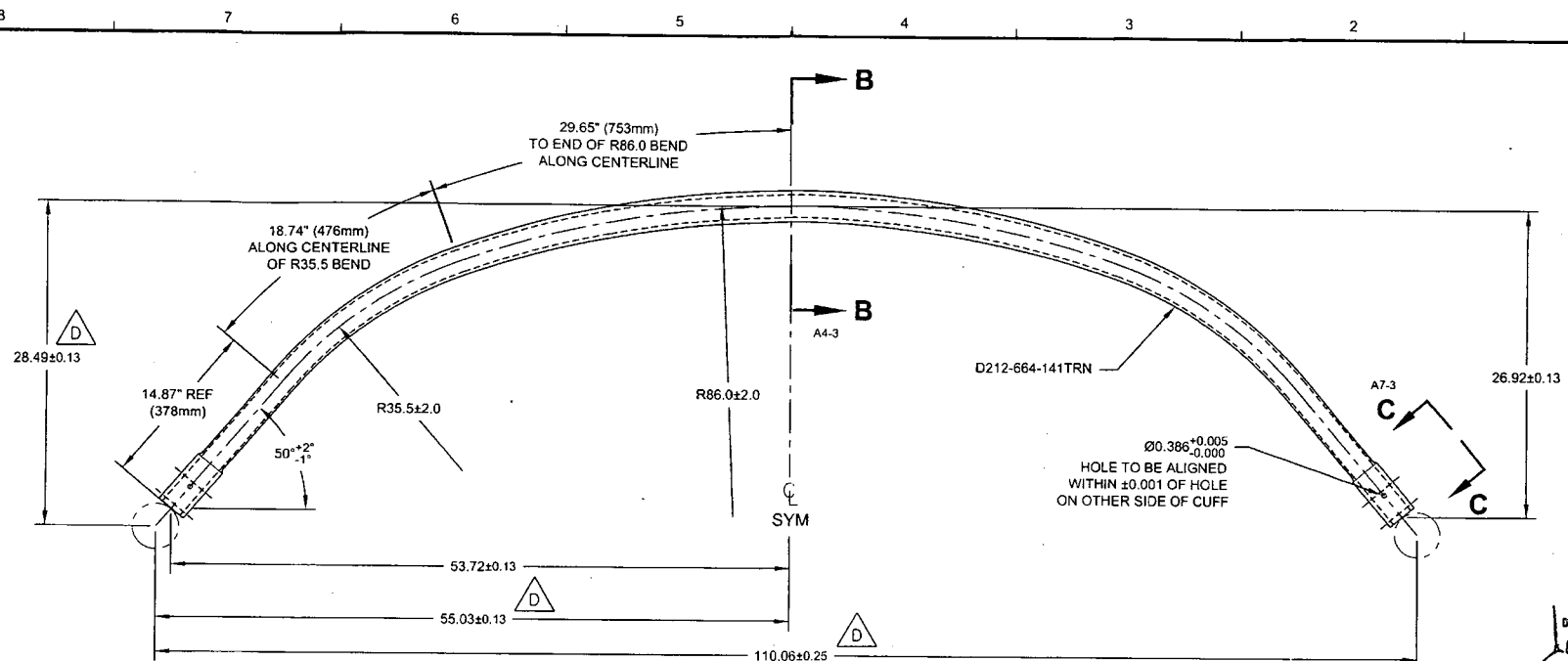
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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

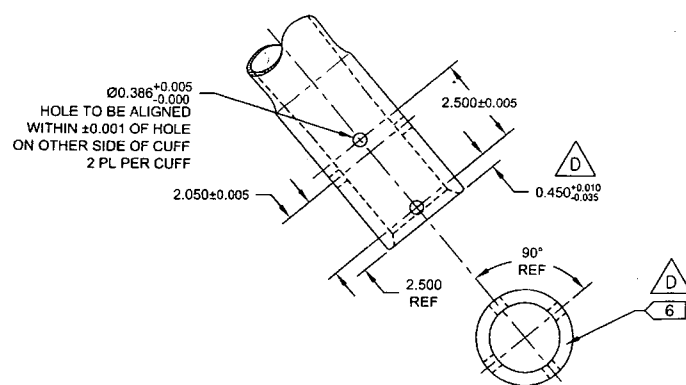
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

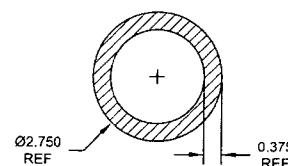
NOTE: Date & initial all entries



D212-664-501
BENDING AND DRILLING DETAIL



VIEW C-C: CUFF DETAIL
SCALE 3X



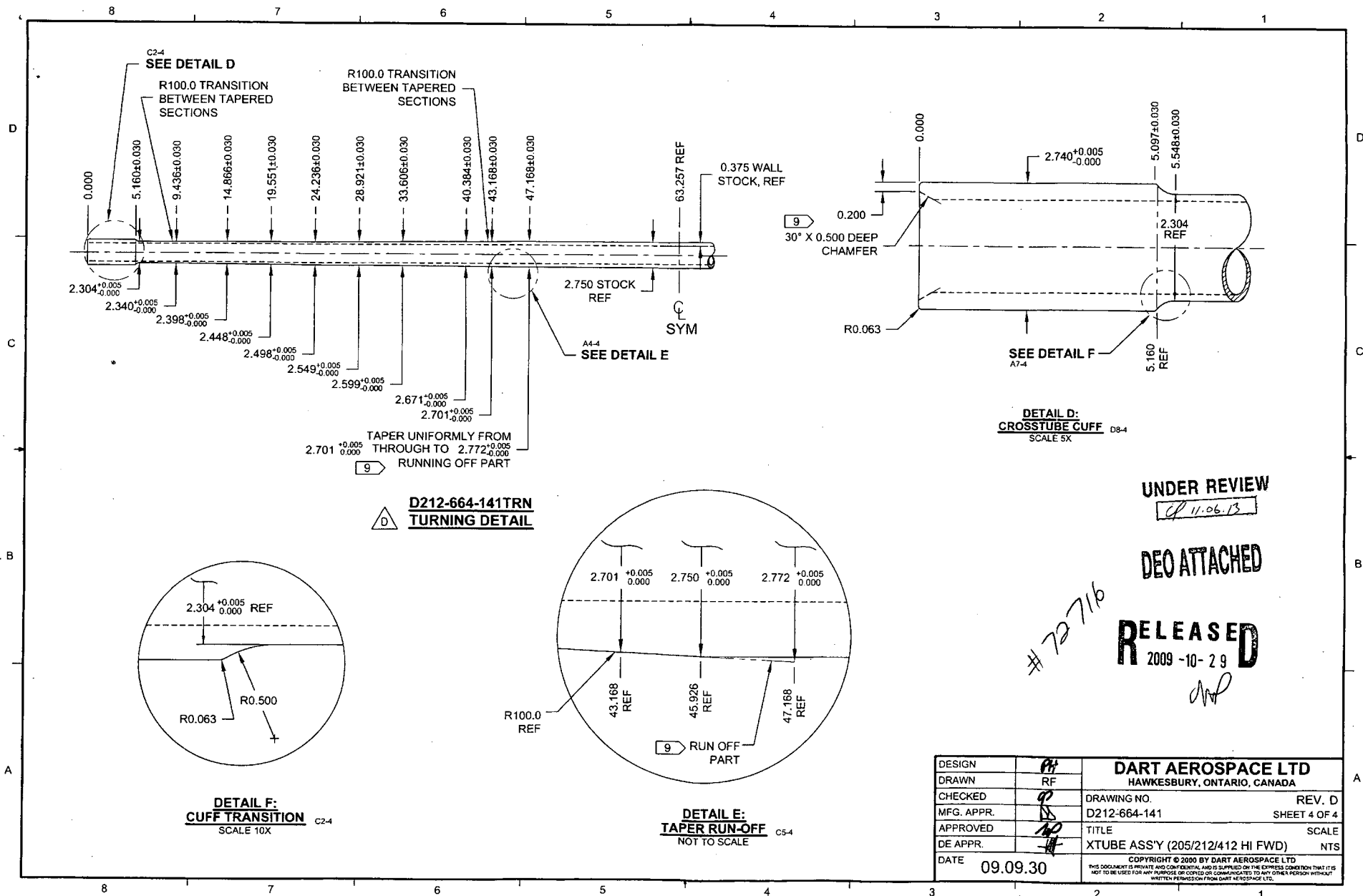
SECTION B-B
SCALE 4X

UNDER REVIEW

DEO ATTACHED

RELEASED
2009-10-29

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	Q	DRAWING NO.	REV. D
MFG. APPR.	DS	D212-664-141	SHEET 3 OF 4
APPROVED	NO	TITLE	SCALE
DE APPR.	—	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD	
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DRAWING NO. D212-664-141	TITLE XTUBE ASSY (205/212/412 HI FWD)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-141-D-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.			
DATE 11.04.07	DATE 11.07.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

RELEASED
2011-04-18

UNDER REVIEW

14/06.13
12 005 11-614
11.07.28

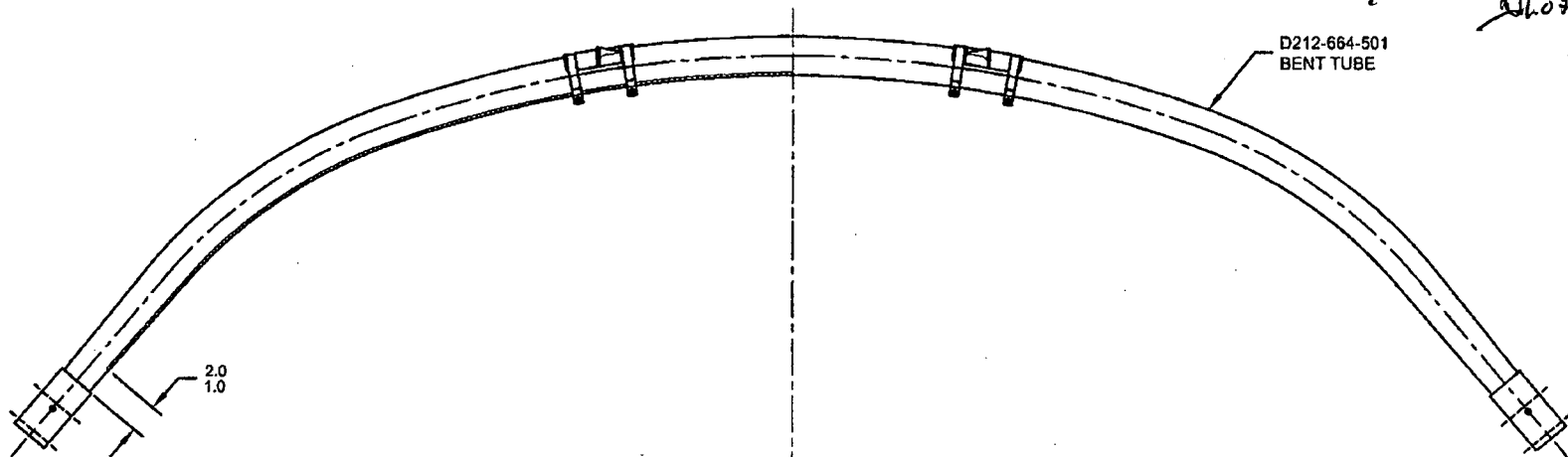
#72716

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DRAWING NO. D212-664-141	TITLE XTUBE ASSY (205/212/412 HI FWD)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-141-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED <i>CP</i>	MFG. APPR. <i>E</i>	APPROVED <i>WAP</i>		DE APPR. <i>W</i>		
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12		DATE 11.04.12		

IS:



WAS:

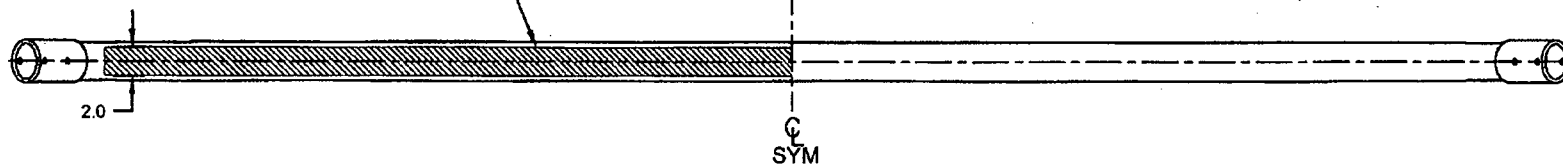
UNDER REVIEW

9/11/06.13

ECU# 11-614
11.07.28

**D212-664-141/-141B
ASSEMBLY DETAIL**

MASK AREA PRIOR TO PAINTING,
REMOVE MASKING AFTER PAINT
AND APPLY CLEAR COAT



72716

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DRAWING NO. D212-664-141	TITLE CROSSTUBE ASS'Y (205 HI FWD)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-141-D-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>UP</i>	CHECKED <i>ADS</i>	MFG. APPR. <i>DS</i>	APPROVED <i>MD</i>	DE APPR. <i>CH</i>			
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11/07/21	DATE 11.07.21			

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -141	Qty -141B	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
---	-----	-----	----------------	---

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2893-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

WAS:

- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RECEIVED
2011-07-28
#72716

5.0 PARTS LIST

5.1 HIGH GEAR CROSSTUBES

Item	-101	-201	-203	Part Number	Description
	X			D212-664-101	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
		X		D212-664-201	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
			X	D412-664-203	CROSSTUBE INSTALLATION, 412 HIGH AFT
1	1			D212-664-141	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
2		1		D212-664-241	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
3			1	D412-664-243	CROSSTUBE ASSEMBLY, 412 HIGH AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21042-26)
13	4			AN6-35A	BOLT
14	4			AN6-36A	BOLT
15	6			MS21042L6	NUT (OR MS21042-6)
16	18			AN960JD616	WASHER
20		2		* D2940-1	SUPPORT
21		4		* D3595-063-530	RUBBER CUSHION
22		4		* MS21920-28	CLAMP (OR MS21042-30)
23		4		AN6-40A	BOLT
24		2		AN6-41A	BOLT
25		6		MS21042L6	NUT (OR MS21042-6)
26		18		AN960JD616	WASHER
30			1	* D2896-1	SUPPORT
31			2	* D2856-600-1009	ABRASION STRIP
32			2	* D3595-063-570	RUBBER CUSHION
33			4	* MS21920-28	CLAMP
34			2	* MS21920-30	CLAMP (OR MS21042-32)
35			4	AN6-40A	BOLT
36			2	AN6-41A	BOLT
37			6	MS21042L6	NUT (OR MS21042-6)
38			18	AN960JD616	WASHER
39			2	* D3189-1	CHAFING SHIELD
50	1	1		D3428-1	PLACARD

*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-141/-241 OR D412-664-243 ASSEMBLIES ABOVE
NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AA
SKIDTUBES.

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Revision: F

Date: 08.09.05



ACUREN

LIQUID PENETRANT TEST REPORT

P- 05100

CLIENT DART AEROSPACE DATE AUGUST 17th 2011 PAGE 1 OF 1
 ATTENTION LINDA LACELL ACUREN JOB NO. 128-11-02343 TIME AM ☒ PM ☐
 ADDRESS 1270 ABERDEEN RD POWO No. 14697
HAWKESBURY, ONT WORK LOCATION Shop
 PROJECT PT WET FLUORESCENT ON 8 CROSSTUBES ACCEPTANCE STD. ASTM 1417/CSI-038 REV./DATE 2005
 ITEM(S) EXAMINED 8 CROSSTUBES AS LISTED BELOW

OB DESCRIPTION PROCEDURE NO. LT-002 REV./DATE 2008 TECHNIQUE No. LT-002 REV./DATE 2008
 PART No. LISTED BELOW MATERIAL ALODINE ALUMINUM THICKNESS
 SCOPE PERFORMED A WET FLUORESCENT L.P.T. on 100% of the EXTERNAL SURFACE ON ALL ITEMS LISTED BELOW

TEST DETAILS

METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
AMLY BRAND	<u>MAGNAFLUX</u>		BLACK LIGHT S/N	<u>13748</u>	
ENETRANT	<u>ZL-67</u>	MINIMUM DWELL TIME	<u>30</u>	MIN.	
ENETRANT REMOVER	<u>H₂O</u>	MINIMUM DRY TIME	<u>>10</u>	MIN.	
DEVELOPER	<u>SKD 32</u>	MINIMUM DWELL TIME	<u>10</u>	MIN.	
DEVELOPER TYPE	<input type="checkbox"/> NON AQUEOUS	<input checked="" type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY		
			LIGHT METER S/N	<u>11/A</u>	
			CAL DUE DATE	<u>AUG/3/2011</u>	

TEST SURFACE

SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < - 4°C / 20°F	<input type="checkbox"/> - 4°C / 20°F TO 10°C / 50°F	<input checked="" type="checkbox"/> 10°C / 50°F TO 52°C / 125°F	<input type="checkbox"/> > 52°C / 125°F	

RESULTS- (☐ METRIC ☐ IMPERIAL)

1	W.O	71753	✓
2	W.O	71749	✓
3	W.O	71750	✓
4	W.O	72761	✓
5	W.O	72760	✓
6	W.O	72716	✓
7	W.O	72679	✓
8	W.O	72678	✓

NO RELEVANT INDICATIONS DETECTED AT THE TIME OF INSPECTION

ITEM: 1 D407-667-105
 2 D212-664-101
 3 D212-664-101
 4 D212-664-101
 5 D212-664-101
 6 D212-664-101
 7 D212-664-101
 8 D212-664-101

PT 11-08-12

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE	<u>Jan Titley</u>	DTR #
TECHNICIAN (SIGNATURE):	<u>Sebastien Dault</u>	REPORT REVIEWED BY:
NAME (PRINT):	<u>SEBASTIEN DAULT</u>	NAME INITIALS
CGSB LEVEL <u>II</u> SNT LEVEL	CGSB LEVEL SNT LEVEL	
CGSB REG. No <u>12959</u>	CGSB REG. No	